

U.S. ARMY ANNOUNCES PROPOSED CLEANUP PLAN FOR FORT DES MOINES, IOWA

This Proposed Plan identifies the preferred alternative for cleaning up environmental areas of concern at Fort Des Moines (FDM), in southern Polk County, Iowa. In addition, the Plan includes summaries of other alternatives that were evaluated for this facility. This document is issued by the U.S. Army (Army), the owner of the site. The Army, in consultation with the Environmental Protection Agency (EPA) and the Iowa Department of Natural Resources (DNR), will select a final remedy for the areas of concern after the public comment period has ended and the information submitted has been reviewed and considered. The selected final cleanup remedy will be presented in an Army Decision Document.

The Army is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as the "Superfund Program", and the National Environmental Policy Act of 1969 (NEPA). Although FDM is not on the National Priorities List (NPL) or considered a Superfund site, this plan has been prepared in accordance with the document entitled, "A Guide to Developing Superfund Proposed Plans", issued by the U.S. Environmental Protection Agency (EPA, 1990).

A Proposed Plan is intended to be a fact sheet that summarizes, for public review, the comparative analysis of the different cleanup alternatives considered. The Proposed Plan for FDM summarizes the information contained in the Environmental Investigation/Risk Assessment/Alternatives Analysis (EI/RA/AA) report, the EI/RA/AA Report Addendum, the Action Memorandum for Fort Des Moines, and related documents that are contained in the administrative record file for this facility.

The public is encouraged to review these documents to gain a more comprehensive understanding of the site and the environmental activities that had been conducted there. The administrative record file, which contains the information upon which the selection of the cleanup action will be based, is available at the following locations:

- Des Moines Public Library
(Main Branch)
100 Locust Street
Des Moines Iowa 50309
(515) 283-4152

or

- Des Moines Public Library
(Southside Branch)
1111 Porter Avenue
Des Moines, Iowa 50315
(515) 242-2685

Hours: Monday - Wednesday 10 a.m. - 9 p.m.
Thursday - Friday 9 a.m. - 6 p.m.
Saturday 10 a.m. - 5 p.m.
Sunday Closed

Contact: Lorna Truck (515) 283-4152

Please note that a glossary and explanation of the evaluation criteria in this Plan can be found near the end of this document.

SITE BACKGROUND

Historical and Environmental Setting

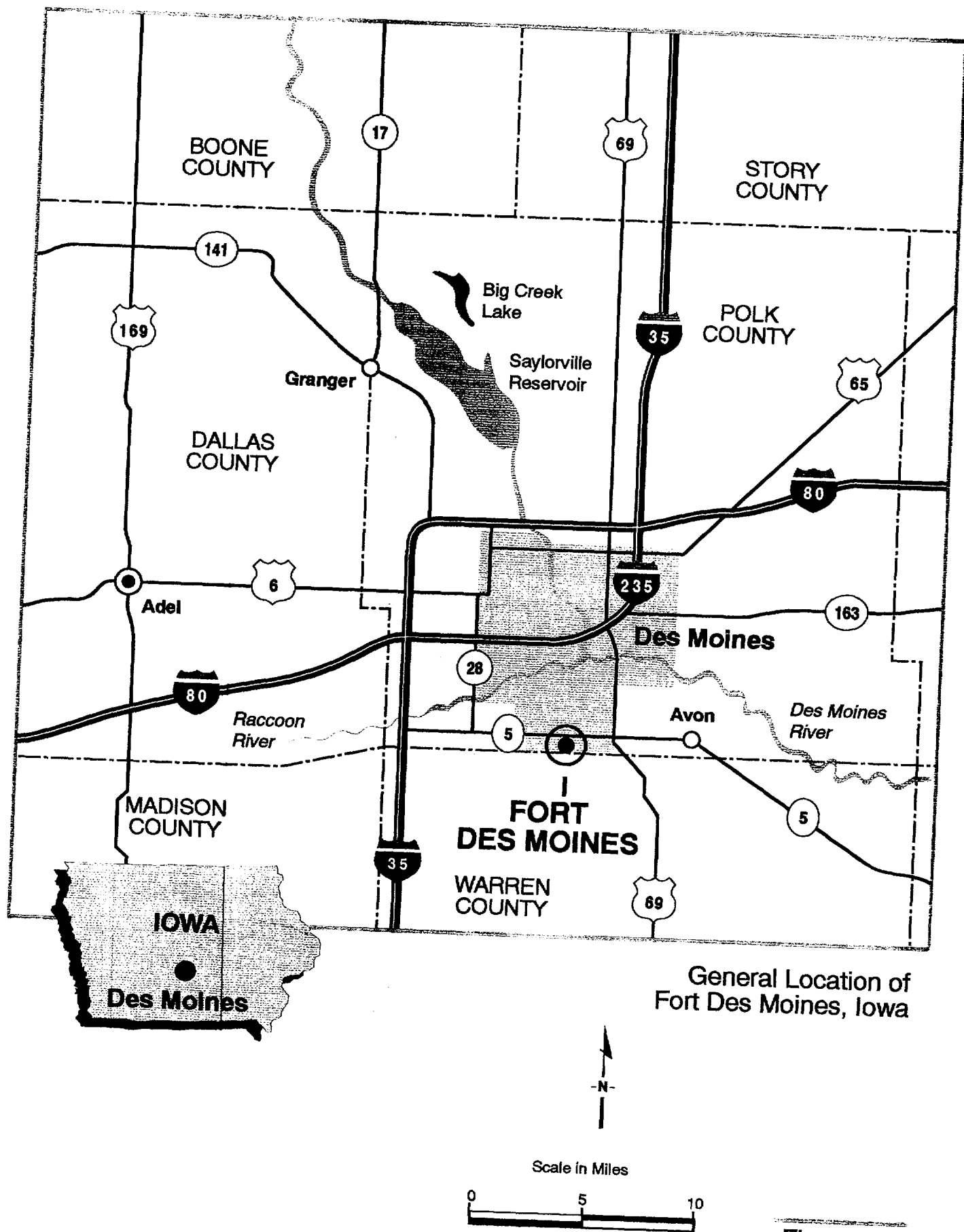
Fort Des Moines (FDM) is an open post located in southern Polk County within the city limits of Des Moines, one mile east of the Des Moines Municipal Airport (see Figure 1). Present day FDM consists of 53.3 acres that represent the remaining portion of a former U.S. Army cavalry post originally established in 1903 on 640 acres. Much of the original FDM property has already been transferred and is now used for various commercial, residential, and recreational purposes (e.g., Blank Park Zoo). A 30-acre portion of the installation, which is not under consideration for potential property transfer, is currently occupied by the U.S. Army Reserve Center. Most buildings at FDM are currently unoccupied or are used for the storage of reserve troop equipment or maintenance equipment.

FDM was used primarily as a training camp and is listed on the National Register of Historic Places. It served as the first training facility for black officers in the Army, and was used as a training center for the Women's Army Auxiliary Corps in 1942. Buildings constructed prior to 1917

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are considered to be historical structures and are afforded special protection with respect to demolition and alterations/repairs. Twenty seven of the 33 structures within the current FDM are subject to this special protection.

The most environmentally significant tenant operation during the history of FDM was the leasing of Buildings 67 and 138 to the Barco Chemical Company for pesticide blending operations between 1950 and 1959. Building 67 has since been demolished and was located on a parcel that has been transferred to County ownership. Building 138, which is part of the current FDM, is currently boarded up and locked to minimize access. Both of these buildings are located near the western boundary of the current FDM. Figure 2 shows the current FDM boundary, some of the neighboring properties, and the general layout of the buildings.

A series of environmental investigations have been ongoing at the FDM since 1988. More recently, an EI/RA/AA was conducted as part of the base closure process between November 1990 and March 1993, and included a baseline risk assessment and an evaluation of remedial alternatives. This most recent study identified 12 areas of environmental concern associated with the current FDM. The locations of these areas of concern, exclusive of site-wide issues such as radon, asbestos containing materials, and lead-based paint are shown on Figure 3. The 12 areas of concern are:

- Building 138 - Pesticides and herbicides are present throughout the interior of this building (primarily in the basement) as the result of historic pesticide and herbicide blending activities conducted between 1951 and 1959.
- Groundwater - Volatile organic compounds (VOCs) and pesticides at or above applicable or relevant and appropriate requirements (ARARs) were detected in the shallow aquifer near Building 138 and former Building 67. The presence of these contaminants may be associated with historic pesticide and herbicide blending activities at the two buildings. The suspected source of this contamination is the storm sewer line that runs between the two buildings.
- Soil - Pesticides were detected in soil samples collected around the above mentioned buildings during the EI. The highest concentrations occurred in a "hot spot", located just to the south of Building 138. In addition, soil samples collected between the two buildings, and near Monitoring Well-1 (MW-1), contained elevated levels of pesticides, VOCs, and low levels of dioxin.
- Unrestricted Disposal Area 1 - Uncontrolled dumping of tires, furniture, appliances, and bulk residential-type items had occurred here in the past. No evidence was found to indicate that chemical disposal had occurred in this area.
- Underground Storage Tanks (USTs) - Four tanks still require removal and closure to comply with state requirements. The four tanks consist of a 10,000-gallon gasoline tank and a 1,500-gallon fuel oil tank (near Building 127) and two 500-gallon fuel oil tanks (near Buildings 83 and 86). [The removal of these USTs is almost complete but they are left in this plan for economic comparisons.]
- PCB Transformers - Thirty-three transformers at 19 on-site locations were evaluated for the presence of polychlorinated biphenyls (PCBs). Five of the 33 transformers were found to be "PCB containing" because they contain PCBs at concentrations greater than 500 parts per million (ppm). Eight transformers were found to be "PCB-contaminated" because they contained PCBs at concentrations between 50 and 500 ppm.
- Small Arms Firing Range Sand - Buildings 58 and 81 contained indoor small arms firing ranges equipped with sand pits to collect spent ammunition. As a result, the sand pits contain elevated levels of several metals, primarily lead. It is estimated that approximately 12 cubic yards of sand within these buildings would require removal and disposal.
- Stored Inventory of Chemicals - Small quantities of chemical materials are stored at various locations throughout FDM. These materials include old paint and lubricants, miscellaneous petroleum products, etc. An estimated 1,650 gallons of stored materials require removal and appropriate disposal.
- Radon - A facility-wide radon evaluation was conducted as part of the environmental investigation. Radon levels above the EPA guidance level of 4.0 picocuries per liter (pCi/L) were detected only in Buildings 63 (5.4 pCi/L) and 72 (7.3 and 7.8 pCi/L) during the initial and confirmation sampling effort.
- Asbestos-containing Materials (ACM) - Asbestos sampling was conducted in every building with the exception of Building 138, which was not sampled because of both structural hazards and the presence of pesticides. The ACMs detected included both friable materials (i.e., breaks readily apart in your hand), such as pipe insulation and elbows and boiler tank insulation, and non-friable materials, such as floor tile/linoleum, and transite panels.

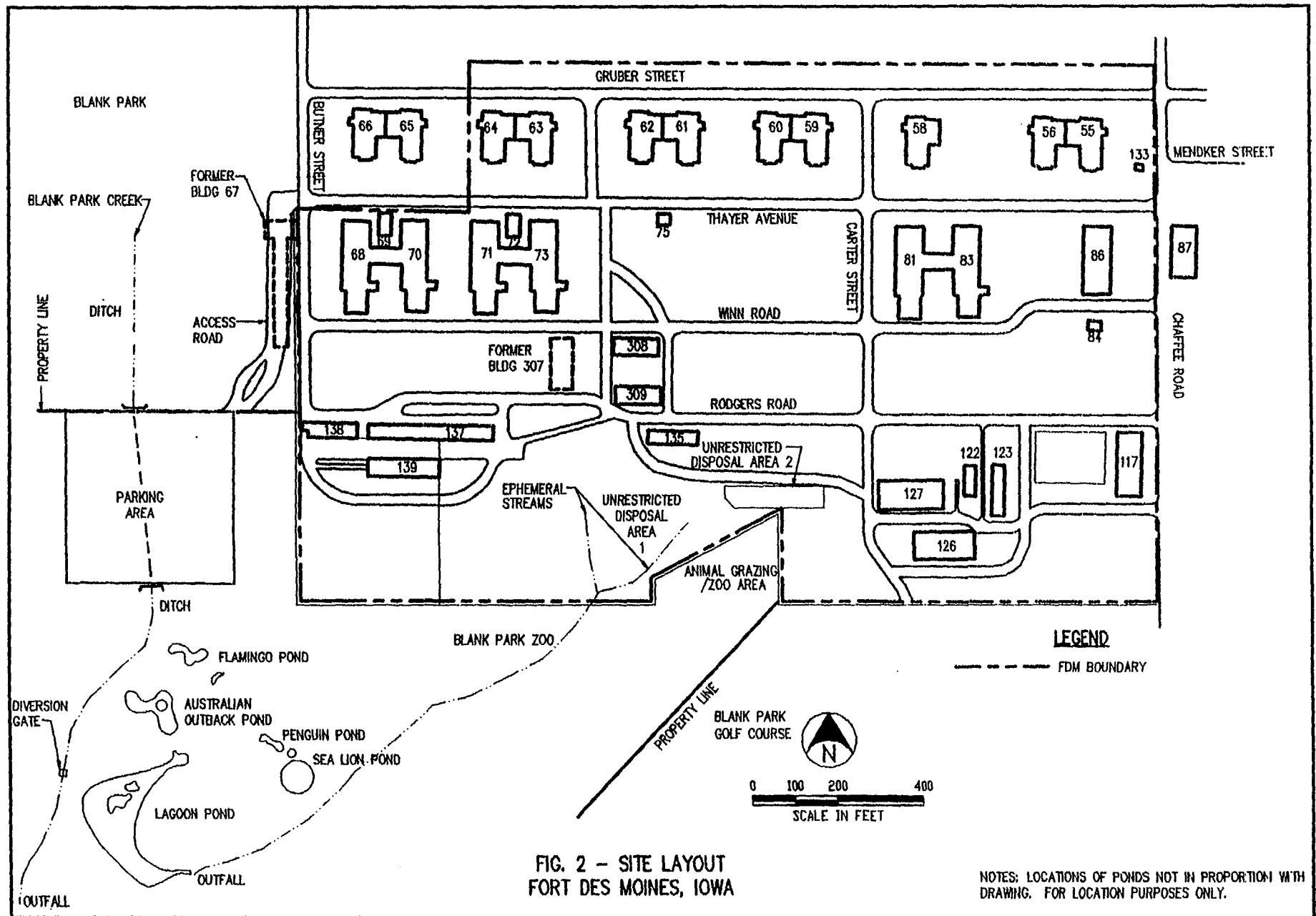


FIG. 2 - SITE LAYOUT
FORT DES MOINES, IOWA

NOTES: LOCATIONS OF PONDS NOT IN PROPORTION WITH
DRAWING. FOR LOCATION PURPOSES ONLY.

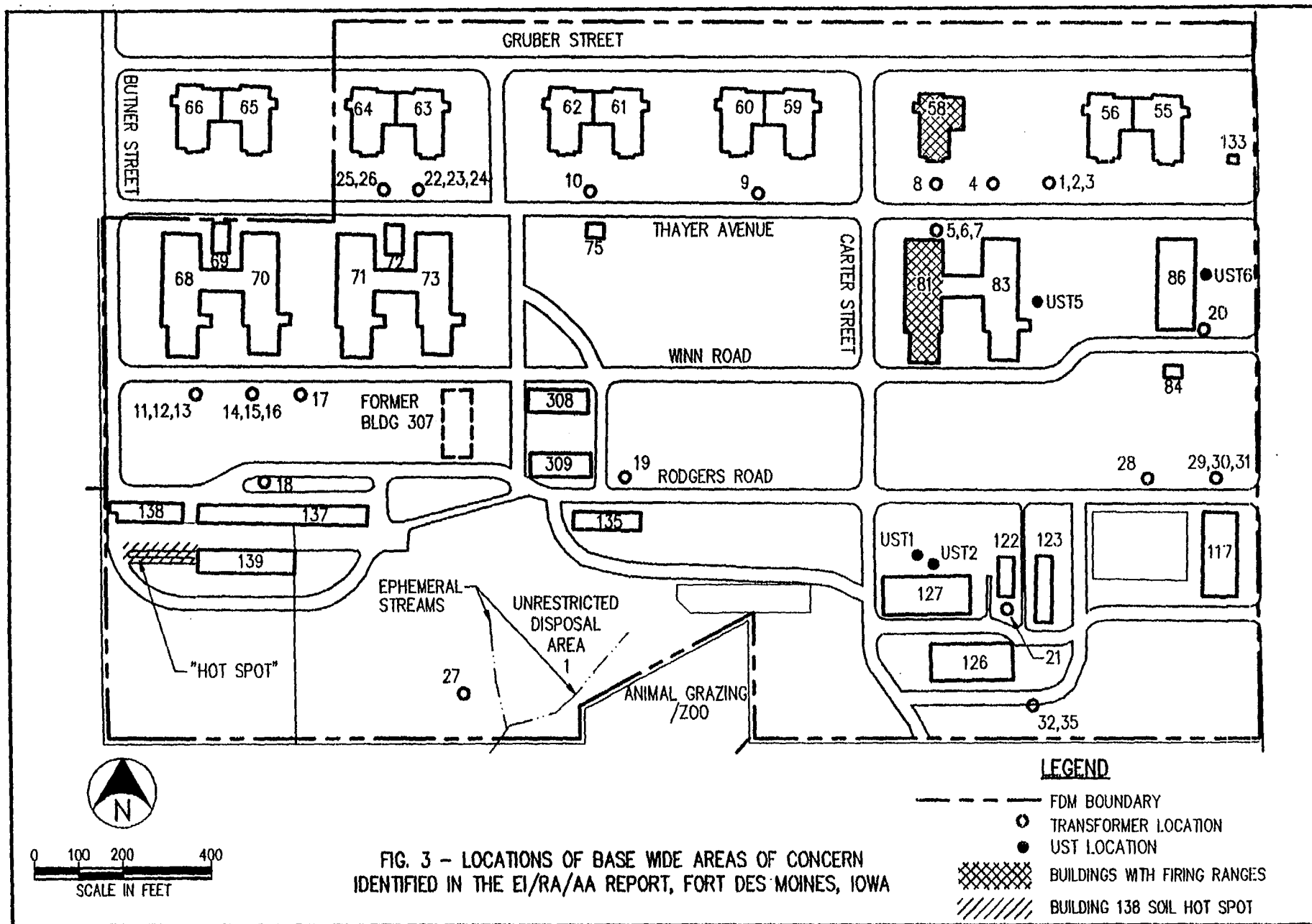


FIG. 3 - LOCATIONS OF BASE WIDE AREAS OF CONCERN
IDENTIFIED IN THE EI/RA/AA REPORT, FORT DES MOINES, IOWA

- **Lead-based Paint (LBP)** - Facility-wide sampling indicated that the majority of the composite building samples exceeded the lead guidance level of 0.5 percent by weight set by the U.S. Department of Housing and Urban Development (HUD). Because of the sampling results and the age of the on-site buildings, all structures were assumed to have some LBP present.
- **Blank Park Creek Sediments** - Pesticides and a limited number of metals were detected in sediment samples collected from Blank Park Creek, which is located west of the current FDM boundary. This creek is an ephemeral stream that receives storm water runoff from not only the current FDM, but also from nearby roadways and properties to the north and west. The study results suggested that numerous nearby off-site, non-point sources may be substantial contributors for the contaminants detected in the stream. The potential on-site contributing contaminant sources (e.g., the storm sewer line between Buildings 67 and 138) for the constituents detected in the creek were identified in the EI/RA/AA Report. It is felt that the cleanup of identified on-site sources (e.g., excavation and removal of the storm sewer line), as discussed in the EI/RA/AA Report and elsewhere in this Plan, would adequately address this particular area of concern as it relates to the current FDM. Therefore, this area of concern was not addressed specifically as the other areas were in the alternative analyses.

Based on the findings of the Draft EI/RA/AA report, as presented in December 1993, the Army Corps of Engineers (Omaha District), was concerned that Building 138, a potential historically significant building, might be heavily contaminated with dioxin. Under the scenario as described in the EI/RA/AA report, the only effective resolution for cleaning up the building was to decontaminate the building interior, demolish the structure afterwards, and incinerate the construction debris off site at a permitted facility.

Because of the dioxin concern, the U.S. Army Corps of Engineers (Omaha District), under their rapid response contract, performed a detailed testing study of Building 138's interior in 1994. The results of the follow-up study, which are presented in the Omaha District's "Action Memorandum for Fort Des Moines", indicated that dioxin contamination was not as serious or as widespread within the building interior as originally presumed. Based on the new findings, the Army revised their intentions for Building 138 to allow for the potential reuse of the building after proper decontamination of the interior. This change in recommendations for Building 138 is reflected in this Proposed Plan.

SUMMARY OF SITE RISKS

As part of the EI/RA/AA, a baseline risk assessment (BRA) was conducted to evaluate the current or future potential health or environmental problems that could result if the identified areas of concern at FDM were not addressed. Risk assessments calculate potential health risks using mathematical models to evaluate the ways that humans or other receptors are exposed to chemicals at the site, as well as known toxic effects of the chemicals of concern.

The BRA for FDM evaluated human health risks (i.e., cancerous and noncancerous health effects) under no-action alternative exposure conditions (i.e., in the absence of any cleanup actions to control or mitigate contaminant releases or exposures) for the current land use at the site. Because the site will be transferred from the federal government to public/private use, the risk assessment also considered potential health effects that could result from direct public exposure to contaminants under future potential land use scenarios, including residential uses. A key consideration used in preparation of the risk assessment was the fact that Polk County health regulations prohibit the installation of drinking water wells in areas where municipal water is accessible. This restriction minimizes the chances of direct public exposure to the shallow groundwater at FDM. The potential risks to the present and possible future populations at FDM also were evaluated. The population classifications used for this evaluation included residents, recreational users, commercial users, and construction workers.

The result of the BRA indicated that only three areas/media at the FDM site were found to pose significant potential risks to human health. They were: dust in the interior of Building 138, the shallow soil around Building 138, and the groundwater for the entire site. The total carcinogenic risk from dust within Building 138 was estimated to pose only a slight risk to juvenile trespassers and is currently being addressed. All remaining significant human health risk estimates were associated with future residential-use exposure scenarios. In addition, the groundwater at the site is not used currently, nor is it expected to be used in the near future, for on-site or off-site consumption.

The risk assessment was performed using conservative assumptions and site-specific factors to reflect actual site conditions. This approach tends to over-estimate potential health risks rather than under-estimate them. Additionally, procedures inherent in the risk assessment process bias the estimates of risk on the high end, that is, tend to result in over-estimating potential health risks.

SCOPE AND ROLE OF RESPONSE ACTION

In 1988, the current 53.3-acre FDM site was included in the Department of the Army's Base Realignment and Closure (BRAC) list. The BRAC list defined the current boundary as the BRAC study limit. The U.S. Army Corps of Engineers (Omaha District) will be the lead agency and point of contact for environmental concerns at FDM for the property returned to the community.

The environmental investigation at FDM is now complete, and the completed Alternatives Assessment (AA) of the EI/RA/AA Report describes the proposed cleanup options for the facility. This document was prepared using the alternatives that were evaluated. After public review, a final decision will be made on the preferred remedial alternative, and detailed engineering designs and plans can be developed and cleanup work at FDM can proceed.

The overall role of the preferred cleanup alternative for FDM is to address identified areas of concern by instituting the necessary cleanup actions to prepare FDM for eventual property transfer. Thus, the primary objective of the preferred alternative would be to reduce both on-site and off-site future exposure to the pesticides and associated contaminants detected in soil and shallow groundwater resulting from historic activities associated with Building 138 and former Building 67.

Since the completion of the EI/RA/AA Report, an Addendum was prepared because additional information on the site was obtained after completion of the field activities in 1993. The U.S. Army Corps of Engineers (Omaha District) performed additional sampling at Building 138 in 1994 and determined that pesticide contamination within the structure was not as high as originally estimated using conservative assumptions provided in the EI/RA/AA report. This additional information determined that the building did not have to be demolished and the resultant debris disposed of as hazardous waste.

Another consideration is environmental issues (i.e., radon, ACMs, and LBP) regarding the buildings themselves. Because only two of the on-site buildings currently are occupied, current human health risks associated with the current status of radon, ACMs, and LBP, are minimal. All unoccupied buildings are locked and access points are boarded shut to prevent entry. The complete level of effort required to address radon, ACMs, and LBP cannot be determined until the ultimate reuse of FDM has been resolved.

These building-related areas of concern are primarily health and safety, indoor air quality, or industrial health types of issues and usually are not covered or addressed under CERCLA activities. The

Army, however, in their desire to expedite the remediation and cleanup of environmental issues at FDM have included these in this Proposed Plan for consideration.

SUMMARY OF ALTERNATIVES

An analysis of potentially applicable cleanup methods was performed for the areas of environmental concern that were described earlier. Various methods or solutions were selected for each area of concern based on their general implementability and effectiveness at the respective sites. After screening out those solutions that were perceived not to be effective, the most appropriate solutions were grouped into three categories. These are:

Category 1 - Areas having only a single recommended cleanup solution;

Category 2 - Remedial Action for Radon, Asbestos and Lead-based Paint for Existing Buildings; and

Category 3 - Groundwater Cleanup.

Each of these categories is discussed below.

Category 1: This category consists of seven areas of concern that have only a single recommended cleanup solution. These are:

- Building 138 Interior - Remove and dispose of dust and residue, stored chemicals, friable ACMs, and elevator shaft fluid; power wash applicable building materials; dispose of fluids and solid waste as potential hazardous waste materials.
- Surface Soils Around Building 138 - Excavate soil "hot spot" south of Building 138 and transport for off-site incineration at a RCRA permitted facility.
- Unrestricted Disposal Area 1 - Collect and properly dispose of debris.
- Underground Storage Tanks - Closure of the four remaining tanks by excavation and removal in accordance with state regulations. [Removal of these tanks is almost complete.]
- Electrical Transformers - Drain and properly dispose of fluid from 13 transformers (i.e., five PCB-containing; eight PCB-contaminated); properly clean and dispose of the drained transformers.
- Small Arms Firing Ranges - Perform hazardous waste characterization analysis on the sand within the buildings, and dispose of it in accordance with applicable regulatory criteria.
- Stored Chemical Materials - Collect, lab-pack, and transport for proper off-site disposal.

Category 2: Three options were considered for dealing with radon, asbestos, and lead-based paint in the existing buildings at FDM, based on the current and possible future building use scenarios. These scenarios are:

1. Buildings Remain Unoccupied - No action for radon, ACMs, or LBP, continue access restrictions.
2. Buildings Prepared for Commercial Reoccupancy - Monitor for the presence of radon for one year in Buildings 63 and 72; and removal of friable ACM and partial removal of LBP with development of Operations & Maintenance (O&M) plans for the remaining materials.
3. Buildings Demolished - No action for radon; remove and dispose of friable ACM and LBP; and demolish buildings.

Category 3: Four options were considered for dealing with the contaminated groundwater. These options were:

1. No Action
2. Source Removal - Excavation and removal of the storm sewer line and associated impacted soils between Buildings 67 and 138. All waste would be transported off-site for incineration at a RCRA-permitted facility.
3. Long-term Monitoring - Source removal (Option 2) along with long-term groundwater monitoring (30 years).
4. Pump and Discharge - Source removal (Option 2) along with extraction of groundwater and discharge via the local sewer system to the local publicly-owned treatment plant (POTW).

Site-Wide Alternatives

The EI/RA/AA report established 10 separate site-wide cleanup alternatives based on different combinations of these three categories. These alternatives were evaluated according to the nine superfund evaluation criteria. Five of the alternatives were retained for further consideration, and presented for regulatory and additional Army review. During this additional review, one of the alternatives was re-introduced. This alternative includes portions of the other five retained alternatives, but in a slightly different combination. These alternatives are numbered to correspond with the EI/RA/AA report. The six alternatives are summarized below:

Alternatives Summary						
Category	Alternative					
	1	3*	4	5	6	10
Complete Remed. (Category 1)		X	X	X	X	X
No Action (Cat. 2.1)	X	X	X			
Army Protocol/Reuse (Cat. 2.2)				X	X	
Demolish Buildings (Cat. 2.3)						X
No Action (Cat. 3.1)	X					
Source Removal (Cat. 3.2)				X		
Source Removal and Monitoring (Cat. 3.3)		X			X	
Source Removal and POTW Discharge (Cat. 3.4)			X			X

* Alternative not retained for further consideration in the EI/RA/AA report.

Common Elements

Except for Alternative 1, each of the other five alternatives address the remediation concerns for the seven areas identified in Category 1. The estimated common cost for remediating these seven areas of concern is \$363,700.

Alternative 1: No Action

Capital Cost:	0
Operations & Maintenance (O&M) Cost:	0
Present Worth Cost:	N/A
Period of Implementation:	N/A

The CERCLA program requires that the "No Action" Alternative be evaluated to provide a baseline for comparison. Under this alternative, the Army and the appropriate regulatory agencies would take no further action. This alternative relies on natural degradation and dispersion processes and continued dilution of the constituents.

Alternative 3:

- Category 1 - Complete remediation of all area sites**
Category 2 - No Action
Category 3 - Groundwater monitoring program with removal of the storm sewer line between Buildings 67 and 138

Capital Cost:	\$836,800
O&M Cost:	\$26,100/year
Present Worth Cost:	\$1,288,200
Period of Implementation:	30 Years

All Category 1 areas of concern will be addressed. While the buildings remain unoccupied, radon, ACM,

and LBP are no threat to human health. This option will be effective based on the current use of the buildings, but will not necessarily be a permanent solution.

A groundwater monitoring program will be implemented in addition to source reduction. Because groundwater use in Polk County is restricted, the contaminated groundwater poses little risk to human health. Source reduction will remove pesticide-contaminated materials from the site that may be contributing to groundwater contamination via infiltration from rainfall, etc. The implementation of the groundwater monitoring program would not aid in complying to health-based criteria, but would allow for observation of future changes in groundwater conditions. Through use of good engineering controls and proper health and safety measures during implementation of this remedial effort, human and environmental risks would be kept to a minimum.

Alternative 4:

- Category 1 - Complete remediation of all area sites**
- Category 2 - No Action**
- Category 3 - Extraction wells to collect groundwater for direct discharge to a POTW. Excavation of the storm sewer line between Buildings 67 and 138**

Capital Cost:	\$1,122,000
O&M Cost:	\$144,600/year
Present Worth Cost:	\$2,735,700
Period of Implementation:	15 Years

This alternative would address Category 1 and 2 areas of concern in the same fashion as the previous alternative. Groundwater issues would be addressed by source reduction of the pesticide-contaminated storm sewer line and pumping and discharging contaminated groundwater to the local POTW. The implementation of the proposed pump and discharge program will reduce groundwater contaminant levels to below the guidance levels set by the State of Iowa; however, this does little to further protect human health. Because groundwater use in Polk County is restricted, direct human exposure is unlikely, therefore, the groundwater should pose little risk to human health. Source reduction will remove contaminated materials that may be contributing to groundwater contamination via infiltration from rainfall, etc. With source reduction, natural attenuation would continue to occur, reducing the effects the contaminants have on the local environment.

Alternative 5:

- Category 1 - Complete remediation of all sites**
- Category 2 - Army protocol followed for radon, ACM, and LBP**
- Category 3 - Removal of the storm sewer line between Buildings 67 and 138**

Capital Cost:	\$1,201,700
O&M Cost:	\$0/year
Present Worth Cost:	\$1,201,700
Period of Implementation:	10 Years

All Category 1 areas are addressed. For Category 2 issues, this alternative provides for the monitoring of radon and the removal of ACM and LBP found to be in poor condition. Under this alternative, friable ACM and chipped and cracked LBP, all of which present an immediate human health risk, would be removed. The remaining materials, which would be effectively managed under a long-term O&M plan, might eventually require future remediation. Radon monitoring could end after 1 year or continue for an additional year if remedial measures are taken. The historical preservation covenant would not be breached by reinhabiting the buildings as long as renovation plans are approved by the State Historical Preservation Office (SHPO).

For the Category 3 or groundwater issues, source removal would be implemented. Source reduction for the groundwater is a feasible response to the low level contamination detected, considering the restrictions on local use of groundwater and the requirement for residents and businesses to be linked to the municipal water system. Source reduction would remove contaminated materials that may be contributing to groundwater contamination via infiltration from rainfall, etc. No monitoring would be performed to observe changes to groundwater conditions. Through the use of good engineering controls and proper health and safety measures, human and environmental risks would be kept to a minimum.

Alternative 6:

- Category 1 - Complete remediation of all sites**
- Category 2 - Army protocol followed for radon, ACM, and LBP**
- Category 3 - Groundwater monitoring program in conjunction with removal of the storm sewer line between Buildings 67 and 138**

Capital Cost:	\$1,217,200
O&M Cost:	\$26,100/year
Present Worth Cost:	\$1,668,200
Period of Implementation:	30 Years

All Category 1 areas are addressed. For Category 2 issues, this alternative provides for the monitoring of radon and the removal of ACM and LBP found to be in poor condition. Under this alternative, friable ACM and chipped and cracked LBP, all of which present an immediate human health risk, would be removed. The remaining materials, which would be effectively managed under a long-term O&M plan, might eventually require future remediation. Radon monitoring could end after 1 year or continue for an additional year if remedial measures are taken. The historical preservation covenant would not be breached by rehhabiting the buildings as long as renovation plans are approved by the State Historical Preservation Office (SHPO).

For the Category 3 or groundwater issues, source removal would be implemented in addition to the long-term monitoring program. Source reduction for the groundwater is a feasible response to the low level contamination detected, considering the restrictions on local use of groundwater and the requirement for residents and businesses to be linked to the municipal water system. Source reduction would remove contaminated materials that may be contributing to groundwater contamination via infiltration from rainfall, etc. Monitoring would be implemented to observe changes to groundwater conditions, but provides no additional protection to human health or environment. Through the use of good engineering controls and proper health and safety measures, human and environmental risks would be kept to a minimum.

Alternative 10:

- Category 1 - Complete remediation of all sites**
- Category 2 - Completely remove all ACM and lead-based paint no action for radon**
- Category 3 - Extraction wells to collect groundwater for direct discharge to a POTW. Excavation of the storm sewer line between Buildings 67 and 138**

Capital Cost:	\$1,946,500
O&M Cost:	\$144,600/year
Present Worth Cost:	\$3,558,800
Period of Implementation:	15 years

All Category 1 areas are addressed. For Category 2, radon would no longer be a concern if the buildings are demolished. Army Base Closure Protocol would be followed for ACM and LBP. All friable ACM and LBP would be removed and disposed of prior to demolition to reduce risk to construction workers. The remaining nonfriable ACM (such as floor tiles) could be included in the building demolition waste. The "debris rule" for

characterizing construction debris would be complied with by removing LBP from construction debris prior to disposal. The removed LBP would be handled as hazardous waste and the stripped surfaces as construction debris, with subsequent disposal of the latter in a construction landfill. When demolition plans for buildings are prepared, the plans would be presented to the SHPO because FDM is a historically-registered site.

Groundwater issues (Category 3) would be addressed by source reduction of the pesticide-contaminated storm sewer line and pumping and discharging contaminated groundwater to the local POTW. The implementation of the proposed pump and discharge program will reduce groundwater contaminant levels to below the guidance levels set by the State of Iowa; however, this does little to further protect human health. Because groundwater use in Polk County is restricted, direct human exposure is unlikely, therefore, the groundwater should pose little risk to human health. Source reduction will remove contaminated materials that may be contributing to groundwater contamination via infiltration from rainfall, etc. With source reduction, natural attenuation would continue to occur, reducing the effects the contaminants have on the local environment.

A major barrier to the implementation of this alternative may be the concern for the preservation of historically significant structures. The SHPO must be presented with plans for demolition and approve them prior to implementation. A historical records program for the property may need to be implemented by which the historical aspects of the structures are cataloged in print or on film.

EXPLANATION OF EVALUATION CRITERIA

Nine criteria are used by the Superfund program in evaluating clean-up alternatives. The first two of these criteria must be met by a preferred alternative. Criteria 3 through 7 help balance the advantages and disadvantages of the evaluated alternatives. The last two criteria have the ability to modify the alternatives based on additional regulatory and public input to the Army. A summary of each of these criteria is presented below:

- 1. Overall Protection of Human Health and the Environment** assesses whether an alternative provides adequate protection from the short-term and long-term risks posed by substances present at a site. This protection can be accomplished by eliminating, reducing, or controlling exposures to acceptable levels established during the development of cleanup action objectives.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** assesses whether an alternative complies with ARARs under federal and state laws or provides rationale for invoking a waiver of requirements.
3. **Long-Term Effectiveness and Permanence** refers to the amount of residual risk and the ability of a selected remedy to prove successful after cleanup goals have been met.
4. **Reduction in Toxicity, Mobility, or Volume Through Treatment** assesses the anticipated performance of the treatment technologies that may be used in a remedy, and the ability of the remedy to use treatment rather than landfilling to remove the risk and hazard.
5. **Short-Term Effectiveness** assesses the speed with which the remedy achieves protection as well as the remedy's potential to create adverse impacts on human health and the local environment during the construction and implementation period.
6. **Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.
7. **Cost** evaluates capital and operating and maintenance (O&M) costs.
8. **State Acceptance** addresses whether the State, as based on their review of the EI/RA/AA and the Proposed Plan, concurs with, opposes, or has no comment on the preferred alternative.
9. **Community Acceptance** will be assessed in the Decision Document following a review of the public comments received on the EI/RA/AA report and this Proposed Plan.

COMPARATIVE ANALYSIS OF ALTERNATIVES

A comparative analysis of each alternative was conducted to assess the performance of the alternatives relative to each other. The alternatives were compared based on their ability to effectively address each of the nine Superfund evaluation criteria. A synopsis of the comparative analyses can be found in Table 1. Except for Alternative 1 (No Action), the proposed remedial solutions for Category 1 areas of concern adequately address the nine evaluation criteria.

Overall Protection of Human Health and the Environment

With the exception of Alternative 1, all of the alternatives provide some level of protection of

human health and the environment. For radon, ACM, and LBP (Category 2), the risk to human health is minimal because all but two of the buildings currently are unoccupied. Hence, the "No Action" option presented for each of these three areas of concern in Alternatives 1, 3, and 4 is viable and protective. If, however, future plans for the buildings include reoccupancy (as in Alternatives 5 and 6), or demolition (as in Alternative 10), then the prescribed actions for these alternatives are appropriate. The reoccupancy alternatives, which include abatement of damaged materials for ACM and LBP, also provide for O&M plans for monitoring the remaining materials. Within Alternatives 1, 3, 4, 5, and 6, limited human exposure remains. The complete abatement performed for the demolition of the buildings (Alternative 10) removes any exposure to future inhabitants.

For groundwater problems (Category 3), source reduction (all alternatives except for 1), consisting of the excavation of the stormwater line between Building 67 and 138, and the decontamination of Building 138, effectively contributes to the protection of human health and the environment. By removing the source of contamination, additional potential contamination would be eliminated. Secondly, the restrictions already in place for groundwater use in Polk County minimize the possibility of exposure to humans.

The use of a groundwater monitoring program, as suggested in Alternatives 3 and 6, does not necessarily increase the protection of human health or the environment. The implementation of a groundwater pump and discharge system to the POTW (as in Alternatives 4 and 10) will increase the protection to the environment by removing contaminants from the groundwater and lowering contaminant concentrations. The removal of the contaminant sources, however, is still the most effective overall action in preventing any additional contamination from entering the groundwater.

Compliance with ARARs

No compliance with ARARs is achieved with Alternative 1. For radon, ACM, and LBP, prevention of inhalation/ingestion of these contaminants would be achieved in the other five alternatives. Under Alternatives 3 and 4, buildings would not be inhabited and exposure unlikely. In Alternatives 5 and 6, radon, ACM, and LBP are addressed as prescribed by the Army Base Closure Protocol (which follows EPA guidelines) in order to reduce human exposure. If the buildings are to be reoccupied (as in Alternatives 5 and 6), the historical significance of the buildings needs to be considered, and measures need to be taken to consult with the SHPO on the rehabilitation plans. If demolition is planned for the buildings, the scenario in Alternative

10 should be followed. All friable ACM would be removed prior to demolition and handled separately from construction debris. Additionally, all LBP would be properly stripped from the building surfaces for disposal as hazardous waste prior to demolition.

Under five of the alternatives, source reduction is performed to prevent further degradation in groundwater. Alternatives 3 and 6 include a groundwater monitoring program which, in itself, does not assist in compliance with ARARs, but may be utilized to collect data on the changes to groundwater conditions, which, with source reduction, is assumed to improve due to natural attenuation. The pump and discharge scenario in Alternatives 4 and 10 actively reduces concentrations, within limits, toward health-based guidance levels. Because Polk County codes prohibit the use of the shallow groundwater, the implementation of a pump and treat system may not be necessary.

Long-term Effectiveness and Permanence

The No Action alternative does not provide long-term effectiveness and permanence, except that access restrictions would continue. The affected buildings are currently unoccupied, however that will probably not be their permanent status. The remedial actions proposed for ACM and LBP in Alternative 10 are a permanent response to these areas of concern. The scenario of partial abatement of ACM and LBP with O&M plans, as proposed in Alternatives 5 and 6, would be effective for the long term.

Source reduction for the groundwater contamination under Alternatives 3, 4, 5, 6, and 10 is a permanent and long-term action. Monitoring of the groundwater does not add to the long-term effectiveness of Alternatives 3 and 6, but can provide data for observing the potential decrease of contaminants in groundwater following implementation of source reduction. The pump and discharge option under Alternatives 4 and 10 for groundwater would increase the long-term effectiveness only slightly. The most effective measure for eliminating risks or hazards associated with the shallow groundwater is through Polk County's current use restriction code.

Reduction of Toxicity, Mobility, or Volume

The reduction of toxicity, mobility, or volume by treatment is accomplished in most of the Category 1 areas evaluated. For the Category 2 and 3 areas of concern (i.e., radon, ACM, LBP, groundwater), active reduction only occurs when the extracted groundwater is treated at the POTW as in Alternatives 4 and 10. However, the reduction of these characteristics apply to treatment technologies,

and have little influence on the effectiveness of the cleanup options presented.

Short-term Effectiveness

The short-term effectiveness evaluation criterion is not applicable to Alternative 1 because no remedial activities are implemented. All the other alternatives should be effective in the short term, if proper engineering controls and effective health and safety measures are employed during demolition activities. Alternative 10 is the most likely to have potentially detrimental short-term effects because it involves extensive demolition activities. The remediation proposed in this alternative is the most extensive and requires complete remediation of ACM and LBP.

Implementability

Technically, Alternative 1 is easily implementable because the activities would be limited to continuance of institutional controls. Administratively, this alternative may not be implementable, in that, it is unlikely that the various agencies would accept this alternative. Alternatives 3 and 6 provide additional protection through monitoring of the groundwater, but require a long-term commitment and, outside of source reduction, offer no active reduction in the groundwater contaminants or the associated liability. Alternatives 4 and 10 do provide for the cleanup of the groundwater. The local POTW would require no pretreatment for the groundwater at the expected contaminant levels.

The options provided for cleanup of the areas of concern in all three categories are all technically implementable in that they apply proven, reliable, and effective methods. The services and equipment necessary to carry the alternatives through to completion are all readily available. The National Historic Preservation Act, however, may pose, under Alternative 10, an administrative impediment to the demolition of some of the potentially historically significant buildings.

Cost

Table 2 summarizes the costs (in 1995 dollars) associated with each of the six retained alternatives. The implementation of Alternative 1, No Action, entails no additional cost, and continued access restrictions would involve little expenditure.

The remaining five alternatives share a fixed cost of \$363,700, which includes the costs associated with remediation of the Category 1 areas. These Category 1 costs include: UST removal; PCB transformer disposal; sand disposal at the Firing Ranges; decontamination of Building 138; excavation

and disposal of impacted soils from the Building 138 "hot spot"; disposal of stored chemicals; and removal and disposal of debris in Unrestricted Disposal Area 1. This cost differs from the \$680,000 (in 1993 dollars) for the Category 1 costs presented in the EI/RA/AA report because demolition and disposal of Building 138 is no longer necessary.

Costs in each of the alternatives (except 1) include addressing the building-related areas of concern under the Category 2 option. Alternatives 3 and 4 have no Category 2 costs because "No Action" is the remedial response. Alternatives 5 and 6 include Category 2 costs (\$380,000) for the removal of ACM and LBP that appeared to be in poor condition and the development of an O&M plans. Alternative 10 contains the highest Category 2 costs (\$823,100), which involves the complete removal of all LBP and all friable ACM, in preparation for building demolition.

The additional costs under Alternatives 3 and 6 are Category 3 costs (\$458,000) associated with the storm sewer line removal (source reduction). The long-term monitoring program for the groundwater, under Alternatives 3 and 6, would cost \$466,500. Additional costs under Alternatives 4 and 10 are associated with the capital investment and O&M associated with pumping and discharging of the impacted groundwater to the local POTW (\$1,447,500).

SUMMARY OF THE PREFERRED ALTERNATIVE

The Army's preferred cleanup option is Alternative 3, which consists of remediating all Category 1 areas, no action for friable ACM and LBP, and a groundwater monitoring program along with the removal of the storm sewer line between Buildings 67 and 138. The estimated cost of the preferred alternative is \$1,288,200. It will require about 2 years to implement. Sampling and monitoring of the groundwater will be performed for 30 years.

Building-specific issues regarding ACMs, radon, and LBP can not be adequately addressed as the future usage of buildings at FDM has yet to be decided. The Army's preferred options for addressing the building-specific concerns are continuing to prevent access to the buildings (if the buildings are retained by the Army) and full disclosure of these building-specific concerns prior to deed transfer (if the buildings are sold). Currently all but two of the buildings are uninhabited, therefore, there is no current human health risk associated with exposure to ACMs, radon (2 buildings only), or LBP.

For Category 3 (groundwater) issues, the preferred alternative (source removal and a groundwater monitoring program) is considered the

most viable option for cleanup of the contaminated groundwater. This decision is based on the following reasons: (1) the relatively low concentrations of contaminants in the shallow groundwater; (2) removal of the contaminated soils and storm sewer line would prevent additional contaminants from entering the groundwater and attenuation of contaminant concentrations would occur over time; (3) hydrogeologic tests indicate that the affected portion of the shallow aquifer has a low transmissivity and well yield capacity, limiting the effectiveness of a pump and treat system; and (4) current restrictions on the use of the shallow aquifer by Polk County effectively eliminates direct human exposure and, therefore, risks.

Compliance with ARARs is achieved by the implementation of Alternative 3. Source reduction for the groundwater is a feasible response to the low level contamination, considering the county restrictions on local groundwater use and the requirement for residents and businesses to be linked to the municipal water system.

Administratively, no barriers to the implementation of this alternative are expected in that the activities that would be undertaken entail standard practices. Obtaining applicable permits and approvals is expected to be a relatively uncomplicated process. The short-term effects of this alternative to human health and the environment during implementation can be minimized through the use of proper engineering controls and effective health and safety measures.

OPPORTUNITIES FOR COMMUNITY INVOLVEMENT

Public Comment Period Announcement

A 30-day comment period will begin on August 1, 1995. The Army requests your written comments on the Proposed Plan and other cleanup alternatives being considered for Fort Des Moines. The EI/RA/AA, Proposed Plan, the Report Addendum, and related documents are available for public review at the information repositories listed on Page 1. Comments may be submitted orally or in writing at the upcoming public meeting. Written comments should be postmarked no later than August 31, 1995, and sent to:

Mr. Dennis Stone
Ft. McCoy Army Installation
Building 2171
Sparta, Wisconsin 54656-5000

Community Meeting Announcement

You are invited to attend an upcoming meeting regarding the Army's Proposed Plan for the cleanup

of Fort Des Moines. Army representatives will report on the cleanup alternatives, including the Army's preferred alternative, hear concerns, and answer your questions.

DATE: August 31, 1995
 TIME: 7:00 P.M. (Tentative)
 PLACE: Army Reserve Center (Tentative)
 19th TAACOM
 225 E. Army Post Road
 Des Moines, Iowa 50315

You will have an opportunity at the meeting to ask questions of Army representatives and comment on the cleanup alternatives. If you have any questions regarding the meeting you should contact Mr. Dennis Stone at (608) 388-4794.

GLOSSARY OF TERMS AND ACRONYMS

AA	Alternatives Analysis
ACM	Asbestos Containing Materials
Aquifer	A layer of sediment or rock beneath the ground surface that is capable of transmitting economic quantities of water to wells and springs. It is sometimes referred to as a water-bearing unit.
ARARs	Applicable or relevant and appropriate requirements (ARARs), which are standards, criteria, or limits promulgated under Federal and State laws.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act. Also known as Superfund.
DNR	Iowa Department of Natural Resources
EI	Environmental Investigation
EPA	United States Environmental Protection Agency
FDM	Fort Des Moines - refers to the currently active 53.3 acre parcel that was the subject of the EI/RA/AA report.
Groundwater	Water beneath the ground surface that fully saturates the space between soil and/or rock particles. Groundwater moves around particles of soil and rock often at slow rates.

HUD	U.S. Department of Housing and Urban Development
LBP	Lead-based paint
NPL	National Priorities List
PCB	Polychlorinated biphenyls are organic compounds used in transformers that are toxic and persistent environmental pollutants and tend to accumulate in animal tissues.
PCB-containing	Refers to medium that contains greater than 500 parts per million (ppm) of PCBs.
PCB-contaminated	Refers to a medium that contains between 50 ppm and 500 ppm of PCBs.
pCi/L	picocuries per liter of air, a unit of measure for quantifying the amount of radon gas that is detected within a room.
POTW	Publicly-owned Treatment Works
ppm	parts per million, a unit of measurement to describe levels or concentrations of contaminants
RA	Risk Assessment, a qualitative or quantitative evaluation of the environmental and/or health risk resulting from exposure to a chemical or physical agent
USAEC	United States Army Environmental Center is based at the Aberdeen Proving Ground in Edgewood, Maryland. Formerly known as United States Army Toxic and Hazardous Materials Agency (USATHAMA).
VOCs	Volatile organic compounds evaporate and change from liquid to vapor readily at normal temperatures. Some common VOCs include trichloroethene, perchlorethene, benzene, and methylene chloride, all of which are commonly used as solvents.
WAAC	Women's Army Auxiliary Corps, former branch of the Army that had a training center at Fort Des Moines in 1942.

**TABLE 1
EVALUATION OF ALTERNATIVES**

SUPERFUND EVALUATION CRITERIA

Remedial Alternatives	Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectiveness and Permanence	Reduction of Toxicity, Mobility, and Volume of Mass	Short-term Effectiveness	Implementability (Technical and Administrative)	Present Worth Cost	State and Community Acceptance
Alternative 1 No action for all three categories	This alternative will not effectively protect human health and environment.	Criterion is not applicable because no activities are implemented under this alternative.	Alternative is not effective in the long term. Risks will remain and may eventually require remediation in the future.	No reduction of toxicity, mobility or volume would be realized.	Criterion is not applicable because no activities are implemented under this alternative.	Technically feasible; easily performed.	No costs	Not likely to be acceptable to agencies or the public; is not protective of human health and the environment.
Alternative 3 Cat. 1 - Complete remediation of all sites Cat. 2 - No action Cat. 3 - Groundwater monitoring program with source removal.	Human health and the environment are protected in areas that pose an immediate concern.	Compliance with ARARs will be achieved.	May not be permanent solution for radon, ACM, and LBP. Groundwater constituents will be reduced.	No reduction of toxicity, mobility or volume of radon, ACM and LBP. Reduction of groundwater constituents likely will occur.	Short-term effects to human health and the environment can be minimized through proper engineering controls and effective Health & Safety measures.	Implementable	Moderately expensive, total cost of \$1,288,200	To be determined during the public comment period.
Alternative 4 Cat. 1 - Complete remediation of all sites Cat. 2 - No action Cat. 3 - Extraction wells to collect groundwater for direct discharge to a POTW and source removal	Human health and the environment are protected in areas that pose an immediate concern.	Compliance with ARARs will be achieved.	May not be permanent solution for radon, ACM, and LBP. Groundwater constituents will be reduced.	No reduction of toxicity, mobility and volume of radon, ACM and LBP. Reduction of groundwater constituents will occur.	Short-term effects to human health and the environment can be minimized through proper engineering controls and effective Health & Safety measures.	Implementable	Expensive, total cost of \$2,735,700	To be determined during the public comment period.
Alternative 5 Cat. 1 - Complete remediation of all sites Cat. 2 - Army protocol for building related areas Cat. 3 - Source removal	Human health and the environment are protected in areas that pose an immediate threat.	Compliance with ARARs will be achieved.	Building-related concerns will be addressed, but may require some future remediation. Natural attenuation of groundwater contamination will occur with time.	No reduction of toxicity, mobility or volume of radon, ACM and LBP. Reduction of groundwater contamination will occur.	Short-term effects to human health and the environment can be minimized through proper engineering controls and effective Health & Safety measures.	Implementable	Moderately expensive, total cost of \$1,201,700.	To be determined during the public comment period..
Alternative 6 Cat. 1 - Complete remediation of all sites Cat. 2 - Army protocol followed for radon, ACM, and LBP Cat. 3 - Groundwater monitoring program with source removal	Human health and the environment are protected in areas that pose an immediate concern.	Compliance with ARARs will be achieved.	Building-related concerns will be addressed, but may require some future remediation. Groundwater constituents will be reduced.	Some reduction of toxicity, mobility or volume of radon, ACM and LBP will be achieved. Reduction of groundwater constituents likely will occur.	Short-term effects to human health and the environment can be minimized through proper engineering controls and effective Health & Safety measures.	Implementable	Moderately expensive, total cost of \$1,668,200.	To be determined during the public comment period.
Alternative 10 Cat. 1 - Complete remediation of all sites Cat. 2 - Completely remove all ACM and lead-based paint no action for radon Cat. 3 - Extraction wells to collect groundwater for direct discharge to a POTW and source removal	Human health and the environment are protected in areas that pose an immediate concern.	Compliance with ARARs will be achieved.	Radon gas is no longer an issue. Complete removal of ACM and LBP will be accomplished. Groundwater constituents will be reduced.	Adequate reduction will occur for radon, ACM, LBP, and groundwater constituents.	Short-term effects to human health and the environment can be minimized through proper engineering controls and effective Health & Safety measures.	Implementable - The only expected barrier of concern is for preservation of historic structures at FDM.	Most expensive, total cost of \$3,558,800.	To be determined during the public comment period.

TABLE 2 Selected Alternatives and Cost Estimate Summary (All Costs are in 1995 Dollars)				
Alternative	Category 1¹ Single Remedial Actions	Category 2 Building Related Areas	Category 3 Groundwater	Totals
1	- 0 - No Action	- 0 - No Action	- 0 - No Action	- 0 -
3	\$363,700	- 0 - No Action	\$924,500 Storm sewer line removal; Monitoring	\$1,288,200
4	\$363,700	-0- No Action	\$2,372,000 Storm sewer line removal; Pump and Discharge to POTW	\$2,735,700
5	\$363,700	\$380,000 Partial Removal/O&M	\$458,000 Source Reduction	\$1,201,700
6	\$363,700	\$380,000 Partial Removal/O&M	\$924,500 Storm sewer line removal; Monitoring	\$1,668,200
10	\$363,700	\$823,100 Complete Removal	\$2,372,000 Storm sewer line removal; Pump and Discharge to POTW	\$3,558,800
¹ Category 1 remedial actions, with the exception of Alternative 1 - No Action, consist of: UST Removal Transformer Disposal Small Arms Firing Range Sand Disposal Decontamination of Building 138 Treatment of Surface Soils around Building 138 Disposal of Stored Chemicals Removal and Disposal of Debris from Unrestricted Disposal Area 1				

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